



## SEQUENCE LISTING

&lt;110&gt; Takara Shuzo Co., Ltd.

&lt;120&gt; DNA POLYMERASES WITH ENHANCED LENGTH OF PRIMER EXTENSION

&lt;130&gt; TKR2050.1

&lt;150&gt; US 08/021,623

&lt;151&gt; 1993-02-19

&lt;150&gt; US 08/483,535

&lt;151&gt; 1995-06-07

&lt;150&gt; US 08/931,818

&lt;151&gt; 1997-09-16

&lt;160&gt; 29

&lt;170&gt; PatentIn version 3.0

&lt;210&gt; 1

&lt;211&gt; 36

&lt;212&gt; DNA

&lt;213&gt; Thermus aquaticus

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (6)..(35)

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36

&lt;210&gt; 2

&lt;211&gt; 10

&lt;212&gt; PRT

&lt;213&gt; Thermus aquaticus

&lt;400&gt; 2

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1 5 10

&lt;210&gt; 3

&lt;211&gt; 35

&lt;212&gt; DNA

&lt;213&gt; Thermus aquaticus

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (2)..(34)

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1	5
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	15
gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc ttt gtg	96
Glu Glu Ala Pro Trp Pro Pro Glu Gly Ala Phe Val Gly Phe Val	
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ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg gcc gcc	144
Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala Ala	
35	40
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gcc agg ggg ggc cggtc cac ccg gcc ccc gag cct tat aaa gcc ctc	192
Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala Leu	
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agg gac ctg aag gag gcg ccg ggg ctt ctc gcc aaa gac ctg agc gtt	240
Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser Val	
65	70
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ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac ccc atg	288
Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro Met	
85	90
	95
ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag ggg gtg	336
Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly Val	
100	105
	110
gcc ccg cgc tac ggc ggg gag tgg acg gag gag ggc ggg gag ccg gcc	384
Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg Ala	
115	120
	125

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130 135 140	
 gag gag agg ctc ctt tgg ctt tac cggtt gag gtg gag agg ccc ctt tcc Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu Ser	480
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 gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac gtg gcc Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val Ala	528
165 170 175	
 tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc cgc ctc Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg Leu	576
180 185 190	
 gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc aac tcc Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn Ser	624
195 200 205	
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210 215 220	
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225 230 235 240	
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260 265 270	
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305 310 315 320	
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gtc ttc cag gag ggg cg <sup>g</sup> gac atc cac ac <sup>g</sup> gag acc gcc agc tgg atg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp Met	355	360	365	1104
ttc ggc gtc ccc cg <sup>g</sup> gag gcc gtg gac ccc ctg atg cgc cg <sup>g</sup> g <sup>c</sup> gcc Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala Ala	370	375	380	1152
aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac cgc ctc Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg Leu	385	390	395	1200
tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc att gag Ser Gln Glu Leu Ala Ile Pro Tyr Glu Ala Gln Ala Phe Ile Glu	405	410	415	1248
cgc tac ttt cag agc ttc ccc aag gtg cg <sup>g</sup> gcc tgg att gag aag acc Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys Thr	420	425	430	1296
ctg gag gag ggc agg agg cg <sup>g</sup> ggg tac gtg gag acc ctc ttc ggc cgc Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly Arg	435	440	445	1344
cgc cgc tac gtg cca gac cta gag gcc cg <sup>g</sup> gtg aag agc gtg cg <sup>g</sup> gag Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg Glu	450	455	460	1392
gc <sup>g</sup> gcc gag cgc atg gcc ttc aac atg ccc gtc cag ggc acc gcc g <sup>c</sup> Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala Ala	465	470	475	1440
gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg gag gaa Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu Glu	485	490	495	1488
atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc ctc gag Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu Glu	500	505	510	1536
gcc cca aaa gag agg gc <sup>g</sup> gag gcc gtg gcc cg <sup>g</sup> ctg gcc aag gag gtc Ala Pro Lys Glu Arg Ala Glu Ala Val Ala Arg Leu Ala Lys Glu Val	515	520	525	1584
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35 40 45

Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala Leu  
50 55 60

Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser Val  
65 70 75 80

Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro Met  
85 90 95

Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly Val  
100 105 110

Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg Ala  
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Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu Gly  
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Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu Ser  
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Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val Ala  
165 170 175

Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg Leu  
180 185 190

Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn Ser  
195 200 205

Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro Ala  
210 215 220

Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala Val

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Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu Gln  
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Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu Pro  
260                    265                    270  
  
Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn Gln  
275                    280                    285  
  
Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu Gln  
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355                    360                    365  
  
Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala Ala  
370                    375                    380  
  
Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg Leu  
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Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile Glu  
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Ala Pro Lys Glu Arg Ala Glu Ala Val Ala Arg Leu Ala Lys Glu Val  
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<151> 1997-09-16

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 Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe Val  
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 Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala Ala  
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gag gag agg ctc ctt tgg ctt tac cggtg gag agg ccc ctt tcc Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Arg Pro Leu Ser	145	150	155	480
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tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc cgc ctc Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg Leu	180	185	190	576
gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc aac tcc Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn Ser	195	200	205	624
cggtt gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt ccc gcc Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro Ala	210	215	220	672
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ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc ctg cag Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu Gln	245	250	255	768
tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc ttg ccg Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu Pro	260	265	270	816
gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc aac cag Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn Gln	275	280	285	864
acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac ctc cag Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu Gln	290	295	300	912
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gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg atc cgg Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile Arg	340	345	350	1056

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aag acc atc aac ttc ggg gtc ctc tac gg <sup>c</sup> atg tcg gcc cac cg <sup>c</sup> ctc Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg Leu 385	390	395	400
tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc att gag Ser Gln Glu Leu Ala Ile Pro Tyr Glu Ala Gln Ala Phe Ile Glu 405	410	415	1248
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ctg gag gag ggc agg agg cg <sup>g</sup> ggg tac gtg gag acc ctc ttc ggc cg <sup>c</sup> Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly Arg 435	440	445	1344
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Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala Leu  
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Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser Val  
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Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro Met  
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Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly Val  
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Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu Gly  
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Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu Ser  
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Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val Ala  
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Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn Ser  
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Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala Val

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Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu Pro  
260                    265                    270

Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn Gln  
275                    280                    285

Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu Gln  
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Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala Phe  
305                    310                    315                    320

Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln Ile  
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Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile Arg  
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Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp Met  
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Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala Ala  
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Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg Leu  
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Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile Glu  
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Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys Thr  
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Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly Arg  
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Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg Glu  
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<212> DNA  
<213> *Bacteriophage lambda*

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36